

AMR-RSA CONTRACT DATA REQUIREMENTS LIST AND DATA REQUIREMENTS DESCRIPTION

Exhibit I to PT-2671-591479

9-Sep-04

Notes:

1. "Final" refers to the released or signed-off initial version as well as subsequent updated released versions, as necessary.

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No.	Data	Description	Preliminary	Final ¹	Delivery Method	JPL Action
A. PLANS						
A1	Management Plan	A document describing the Contractor's approach to managing the AMR-RSA development, integration, and test. The plan shall include a description of business management practices (including but not limited to: performance metrics; subcontracting plan addressing small, disadvantaged businesses; risk management approach; and configuration management approach).	Not Required	1 week after start of Contract	Electronic	Approval
A2	Quality Assurance & Inspection Plan	Documents the details of the Contractor's Quality Assurance activities in accordance with NHB5300.4. Plan shall include descriptions of (1) QA systems & methods used, (2) QA policies & instructions, (3) function, responsibilities, and relationship between each element in organization who implements the quality program, (4) QA interfaces with JPL & suppliers, (5) Contamination Control procedures, (6) QA support for design, fabrication, & testing, (7) Material Review Board Process, (8) Problem Failure Reporting (PFR) Processes, (9) Manufacturing overview with flowchart indicating significant steps and processes	Not Required	2 mos. after start of Contract	Electronic	Approval
A3	Structural Test Plans & Procedures	Structural verification test plan that defines the approach and procedures the Contractor plans to use to verify the structural analysis and capability of the flight hardware. (vibration, acoustic, thermal, thermal-vacuum, etc)	Not Required	2 weeks prior to the Test Readiness Review	Electronic	Approval
A4	Safety Plan	The Safety Plan shall assure adequate safety to personnel, flight hardware, and ground support equipment. The safety considerations shall include storage, assembly, inspection, handling (including shipping and transportation), test, and operations being or to be conducted in all facilities (contractor, subcontractor, JPL, other NASA centers, university, or others). In general, the Safety Plan shall be in keeping with the complexity and risk tolerance of the contract and shall clearly specify the level and scope of hardware safety to be implemented on the project.	Not Required	30 days after start of Contract	Electronic	Approval
A5	Health & Safety Plan	The Safety and Health Plan shall describe the means to be employed by the Contractor to monitor and enforce the safety and health requirements in the AGP. The plan shall also include the Contractor's standards and criteria for imposing safety and health standards upon its subcontractors of any tier and its plans and procedures for monitoring compliance with such standards.	Not Required	30 days after start of Contract	Electronic	Approval
B. DESIGN MODELS & ANALYSES						
B1	Computer Aided Design (CAD) Models	STEP file conversions of the detailed CAD models used for detailed design of AMR-RSA	At PDR	At CDR, updates as required	Electronic	Inspection
B2	Finite Element Models (FEMs)	A detailed NASTRAN FEM of the AMR-RSA in accordance with Exhibit V.	At PDR	At CDR, updates as required	Electronic	Inspection
B3	Finite Element Model Reports	A description of the FEM, including node & element descriptions/ roadmaps, material properties, analytic assumptions/ idealizations, completed checkouts, per Exhibit V	Not Required	At the time of each FEM delivery	Electronic	Approval

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B4	Thermal Analysis Models	Thermal models are to be generated to represent the AMR-RSA design and updates are necessary to keep up with design changes. The final version should represent the final configuration in high fidelity. Models should be in GMM and TMM versions. Both versions require detailed and reduced levels. Acceptable Thermal tools 1. TSS or TRASYS for geometric model 2. SINDA-G or SINDA FLUINT or SINDA-3D for thermal mathematic model	At PDR and as required to meet contractor thermal design needs per SOW	At CDR, updates as required	Electronic	Integration with JPL S/C thermal model to create AMR-RSA temp. maps
B5	Thermal Model Reports	Documentation of the delivered thermal models in details that include node elements, conductance values for both conduction and radiation (RADKs), material properties, power, assumptions, requirements, boundary conditions/environments and summary of temperature predictions. Documentation of the thermal analysis results for AMR-RSA	At the time of each Thermal model delivery	At the time of each Thermal model delivery	Electronic	Approval
B6	Structural Analysis Reports for flight hardware & MGSE	A compilation of the completed structural analyses in accordance with Exhibits IV and V. All material allowables and analytic assumptions are included. The lowest margins of safety for each component are summarized in a Margin of Safety summary table. Results shall be presented in SI units.	At the time of CDR	2 months after CDR	Electronic	Approval
B7	Thermal Analysis Reports	A compilation of the completed thermal analyses. Results shall be presented in SI units.	At the time of CDR	2 months after CDR	Electronic	Approval
B8	On-orbit deformation analysis results	Documentation of the completed analysis for on-orbit dynamic and thermal loading conditions.	At the time of CDR	2 months after CDR	Electronic, spreadsheet file	Approval
C. INTERFACE CONTROL DOCUMENTS						
C1	Mechanical Interface Control Drawing (MICD)	Drawing that illustrates and describes all the agreed upon interface requirements and hardware, including mating and assembly requirements such as bolt torque.	twice - 2 mos. after contract start, at PDR	At the time of CDR	Electronic	Approval
D. DESIGN DOCUMENTS, DRAWINGS, ETC...						
D1	AMR-RSA Design Drawings	Released engineering drawings & engineering changes required to manufacture and inspect flight hardware.	Not Required	At CDR, updates as required	Electronic	Inspection
D2	AMR-RSA Mechanical Interface Control Drawing	Released engineering drawing describing the interface between the RSA and the Spacecraft. Drawing shall be in SI units. Included in this MICD shall be the location of the AMR instrument relative to AMR Coordinate System Origin, Ground Support Equipment (GSE) attach points, the structural attachment types and footprints, specific fastener requirements and the AMR instrument dynamic envelope	At the time of PDR	At CDR, updates as required	Electronic	Approval
D3	Materials and Processes List	A list of ALL materials and processes to be used for flight hardware of AMR-RSA. The associated specifications used for manufacturing shall be included.	Two weeks prior to PDR	At CDR, updates as required	Electronic	Approval
D4	Long-Lead Procurement Items List	A list specifying the long-lead procurement items required by Contractor. The list shall also contain the vendor, estimated price, the no-later-than procurement start date, need date, and the expected procurement process duration.	Not Required	2 mos. after start of Contract	Electronic	Approval

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E. MISSION ASSURANCE & QUALITY ASSURANCE						
E3	End Item Data Package (EIDP)	Documents the fabrication & assembly history of the delivered flight and flight spare hardware. Includes but not limited to: a) As-built data which describes exactly the configuration of a fabricated serialized assembly, including all subassembly & critical QA inspection reports, non-conformance dispositions, vendor parts, indentured parts list; b) Assembly test data and reports; c) a complete listing of parts, assemblies; d) a complete listing of the tests and test results performed, e) A list of a Problem/Failure reports and associated status; f) a summary of all deviations & waivers applicable to delivered items, g) Contractor's certification, with JPL QA representative concurrence, that the deliverable items conform to applicable specifications and the contract, h) Open Engineering Change Instructions (if any), i) list and release status of all as-built drawings; j) safety, handling, packaging, & shipping requirements, k) MRB actions, l) mass measurements, m) as-built alignment data. NOTE: Each delivered RSA requires its own unique EIDP.	Not Required	Submit as part of the AMR-RSA Pre-Ship Review	Hard copies or electronic, if available	Inspection
E4	Non-Conformance Reports (NCR) or Material Review Board (MRB) Actions	Description of the non-conformance and the disposition.	Not Required	Submit within 48 hours of occurrence	Hard copies or electronic.	Approval
E5	Assembly & Inspection Data Sheets (AIDS) or Contractor equivalent forms	Documentation of assembly procedures followed with appropriate QA concurrences.	Not Required	Submit as part of the AMR-RSA Pre-Ship Review	Electronic	Inspection
E6	Problem/Failure Reports (PFRs) or Contractor equivalent	Documentation of failures and corrective actions taken after the first test through delivery of the hardware, using the Contractor's existing failure reporting/tracking system.	Not Required	Within 24 hours of failure	Electronic	Approval
F. TESTING						
F1	Material or Process Developmental Testing Report	Documentation of completed developmental testing.	Not Required	At CDR	Electronic	Inspection
F2	Hardware Testing Reports	Documentation of completed static, vibration, acoustic, thermal-vac testing as well as pre and post hardware verifications.	Not Required	30 days after testing	Electronic	Inspection
G. BUSINESS MANAGEMENT						
G1	Time-Phased Baseline Schedules	Schedules that represent the plan for accomplishing all of the authorized activities necessary to meet the requirements of the SOW within the time constraints imposed by the Performance & Delivery Schedule of the Contract. During initial development of the Schedules, the Contractor shall integrate all schedule levels by establishing common activities or milestones among the various levels.	Not Required	Once, 30 days after start of Contract	Electronic	Inspection
G311	Detailed Network Baseline Schedule	Shall include the following information for each of the Contractor's lowest level activities: a. Activity Description, b. Schedule Start Date & Completion Date, c. Forecast/Estimated Start Date & Completion Date, d. Actual Start Date & Completion Date, e. Predecessor-Successor task relationships, f. Receivables & Deliverables from external sources, g. Schedule Margin. The Contractor shall be responsible for establishing the schedule interdependencies among these lowest – level activities and for identifying the critical path that runs through them.	Not Required	Once, 30 days after start of Contract	Electronic	Inspection

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G2	Patent Rights	Patent Rights-Retention by the Contractor -(Short Form)	Not Required	Interim report every 12 months commencing on the Date of Subcontract-Final Report within three months of completion of work.		Approval
H. REVIEWS, MEETINGS, AND TELECONFERENCES						
H1	AMR-RSA Preliminary Design Review (PDR) Review Presentation Charts	Presentation packages for AMR-RSA Preliminary Design Review. The PDR shall cover the following topics: Requirements, Interfaces, Design, Stress Analysis, Thermal Analysis, Manufacturing Approach, Surface Accuracy Analysis/Inspection Approach. Requirements and interfaces shall be well defined. The preliminary design, stress and thermal analysis shall show that the requirements of Exhibit II can be achieved. The preliminary manufacturing approach shall be described. A surface accuracy and pointing budget shall be established and preliminary analysis conducted to verify requirements can be met.	1 week prior to PDR	At PDR	Electronic	Inspection
H2	Preliminary Design Review Action Item Closure Memo(s)	Documented response to each of the action items recorded at the AMR-RSA Preliminary Design Reviews and assigned to Contractor for closure.	Not Required	6 weeks Post PDR	Electronic	Approval
H3	AMR-RSA Critical Design Review (CDR) Review Presentation Charts	Presentation packages for AMR-RSA Critical Design Review. The CDR shall cover the following topics: PDR Action Item Closure Status, Requirements, Interfaces, Detail Design, Detail Stress & Thermal Analysis, Manufacturing Approach, Surface Accuracy/Pointing Analysis. The requirements and interfaces shall be complete. The detail design shall meet all requirements. All stress and thermal analysis shall be complete. Surface Accuracy and Reflector Pointing Error Budgets will be established and analysis conducted to show on-orbit predictions meet sub-allocations. All development testing will be complete and reported on. The plan for aligning the RSA components shall be presented. The manufacturing approach shall be defined with QA inspection points identified. A description of planned system level tests will be presented.	1 week prior CDR date	At CDR	Electronic	Inspection
H4	Critical Design Review Action Item Closure Memo(s)	Documented response to each of the action items recorded at the AMR-RSA Critical Design Reviews and assigned to Contractor for closure.	Not Required	6 weeks Post CDR	Electronic	Approval
H5	Test Readiness Reviews' Charts	Presentation packages for AMR-RSA Test Readiness Review shall include a description of tests, summary of analysis showing load levels for critical hardware/cases, detailed test approach, test limits for hardware safety.	Not Required	5 days prior to Review date	Electronic	Inspection
H6	Pre-Ship Readiness Review Charts	Presentation package for Pre-Ship Readiness Review shall include final requirements verification matrix, summary of all critical inspections, summary of pointing and surface accuracy analysis/inspection results, and CDR AI Closure status	Not Required	5 days prior to Review date	Electronic	Inspection

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H7	Monthly Management Review Charts	Presentation charts showing technical and programmatic accomplishments, issues and concerns, and plans for the next reporting period. The presentation material shall include margins summary and significant risk list. The presentation material shall include monthly performance relative to plans, detail milestone schedule – updated each month, showing original and revised milestones, as well as progress and schedule variance report for all major subcontracts.	Not Required	3 workdays prior to each scheduled monthly review	Electronic	Inspection